PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 123059/24 LAS	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. **PCT/NZ2003/000292**	International Filing Date *(day/month/year)* 22 December 2003	Priority Date *(day/month/year)* 20 December 2002
International Patent Classification (IPC) or national classification and IPC **Int. Cl.** [7] A23J 1/20, A01J 7/00, A01J 5/00, A01J 11/00, A23C 7/00.		
Applicant SENSORTEC LIMITED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   [X] This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 4 sheet(s).

3. This report contains indications relating to the following items:

   - I [X] Basis of the report
   - II [ ] Priority
   - III [ ] Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV [ ] Lack of unity of invention
   - V [X] Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI [ ] Certain documents cited
   - VII [ ] Certain defects in the international application
   - VIII [ ] Certain observations on the international application

Date of submission of the demand 20 August 2004	Date of completion of the report 4 May 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **ANITA PREMKUMAR** Telephone No. (02) 6283 2515

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/NZ2003/000292

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed.

☒ the description, pages **1-17,** as originally filed,
pages , filed with the demand,
pages , received on with the letter of

☒ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages **18-21,** received on **20 April 2005** with the letter of **20 April 2005**

☒ the drawings, pages **1/2 and 2/2,** as originally filed,
pages , filed with the demand,
pages , received on with the letter of

☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the **language,** all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☒ The amendments have resulted in the cancellation of:

☐ the description, pages

☒ the claims, Nos. **15-20**

☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/NZ2003/000292

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	**1-14**	**YES**
	Claims	**none**	**NO**
Inventive step (IS)	Claims	**1-14**	**YES**
	Claims	**none**	**NO**
Industrial applicability (IA)	Claims	**1-14**	**YES**
	Claims	**none**	**NO**

2. Citations and explanations (Rule 70.7)

The following document identified in the International Search Report has been considered for the purposes of this report:

D1: NZ 280724 (DEC International NZ Limited) 23.12.1996.

D2: WO 1996/011568 A2 (Maasland N.V.) 25.04.96

D3: WO 1996/ 001040 A2 (Maasland N.V.) 18.01.96

D4: WO 1994/008450 A1 (United Kingdom Atomic Energy Authority) 28.04.1994

D5: EP 1,138,192 A1 (DeLaval Holding AB) 04.10.2001

D6: US 3,946,113 (Economics Laboratory, Inc.) 23.03.76

D7: US 4,075,196 (Societe d'Assistance Technique pour Produits Nestle S.A.) 21.02.78

D8: US 4,018,752 (Societe d'Assistance Technique pour Produits Nestle S.A.) 19.04.77

Novelty and Inventive Step:

The invention in the amended claims lies in a method for separating out a milk component, from milk that has been freshly milked by a robotic milking device on a farm. The milking device being adapted to allow one dairy animal to freely enter at any time. The milk is collected in a holding vessel which is connected to a separation device, whereby the milk from the holding vessel may be processed through the separation device at a reduced rate so as to get efficient separation. None of the prior art documents discloses or suggests the use of such a milking device or on-farm separation method, as such claims 1-14 are novel and inventive.

WHAT WE CLAIM IS:

1. Apparatus for on-farm separation of at least one milk component from milk, the apparatus including:

   (i) a robotic milking device having a stall for milking a dairy animal and which is adapted to allow one dairy animal to freely enter at any time;

   (ii) a first holding vessel connected to the stall for receiving successive measures of milk from successive dairy animals;

   (iii) at least one first separation device connected to said first holding vessel for receiving the successive measures of milk and separating each measure of milk into said at least one milk component and a residual milk measure, and

   (iv) a bulk tank connected to each separation device for accumulating the successive residual milk measures.

2. The apparatus of claim 1 further including:

   (i) a second holding vessel connected to said stall for receiving successive measures of milk from respective dairy animals in alternation with the first holding vessel;

   (ii) at least one second separation device connected to said second holding vessel for receiving the respective measures of milk and separating each measure of milk into said at least one milk component and a residual milk measure, and

(iii) a conduit for passing residual milk measures from the second separation device to the bulk tank.

3. The apparatus of claim 1 or claim 2 wherein at least one of said separation devices is formed from a modular cartridge unit incorporating a matrix for removing at least one specific milk component.

4. The apparatus of any one of claims 1 to 3 wherein at least one said separation devices is configured to enable for substitution or replacement of cartridges.

5. The apparatus of any one of claims 1 to 3 wherein at least one said separation devices is configured to enable the cleaning or elution of cartridges.

6. A method for on-farm separation of at least one milk component from the milk produced by a plurality of dairy animals, characterised by the steps of:

(i) extracting a measure of milk from one of said dairy animals in a stall of a robotic milking device adapted to allow one dairy animal to freely enter at any time;

(ii) passing said measure of milk to a holding vessel feeding at least one separation device;

(iii) operating each said separation device to separate said measure of milk into said at least one milk component and a residual milk measure, and

(iv) repeating steps (i) to (iii) in turn for each of said plurality of dairy animals.

7. A method for on-farm separation of milk components from the milk produced by first, second and third dairy animals sequentially milked using the apparatus of claim 2, characterised by the steps of:

   (i) extracting a first measure of milk from the first dairy animal in said stall;

   (ii) passing said first measure of milk to said first holding vessel;

   (iii) operating each said first separation device to empty the first holding vessel and to separate said first measure of milk into at least one first milk component and a first residual milk measure, while extracting a second measure of milk from the second dairy animal in said stall and passing said second measure of milk to the second holding vessel, and

   (iv) operating each said second separation device to empty the second holding vessel and to separate said second measure of milk into at least one second milk component and a second residual milk measure, while extracting a third measure of milk from the third dairy animal in said stall and passing said third measure of milk to the first holding vessel.

8. The method of claim 6 or claim 7 wherein at least one of said components separated by the method is lactoferrin.

9. The method of any one of claims 6 to 8 wherein the dairy animal is a cow.

10. The method of any one of claims 6 to 9 wherein at least one of said separation devices performs ultrafiltration.

11. The method of any one of claims 6 to 8 wherein at least one of said separation devices performs chromatographic separation.

12. The method of any one of claims 6 to 8 wherein at least one of said separation devices performs dialysis.

13. A method for on-farm separation of at least one milk component substantially as herein described with reference to the accompanying drawings.

14. An automated milking device substantially as herein described with reference to and as illustrated by the accompanying drawings.